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PTO/SB/21 (08-03)

Approved for use through 08/30/2003. OMB 0651-0031

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TRANSMITTAL FORM

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Total Number of Pages in This Submission

3

Application Number	10/605,521
Filing Date	10/06/2003
First Named Inventor	Jay Yu
Art Unit	
Examiner Name	

Attorney Docket Number

VIAP0086USA

ENCLOSURES (Check all that apply)

<input checked="" type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment/Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input checked="" type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/ Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation <input type="checkbox"/> Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s)	<input type="checkbox"/> After Allowance communication to Technology Center (TC) <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input type="checkbox"/> Other Enclosure(s) (please identify below):
<input type="text"/> Remarks		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name

Winston Hsu, Reg. No.: 41,526

Signature

Date

12/8/2003

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PTO/SB/17 (10-03)

Approved for use through 07/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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FEE TRANSMITTAL for FY 2004

Effective 10/01/2003. Patent fees are subject to annual revision.

Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT **(\$)** 0.00

Complete if Known

Application Number	10/605,521
Filing Date	10/06/2003
First Named Inventor	Jay Yu
Examiner Name	
Art Unit	
Attorney Docket No.	VIAP0086USA

METHOD OF PAYMENT (check all that apply)

Check Credit card Money Order Other None

Deposit Account:

Deposit Account Number **50-0801**
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FEE CALCULATION

1. BASIC FILING FEE

Large Entity	Small Entity	Fee Code (\$)	Fee Code (\$)	Fee Description	Fee Paid
1001 770	2001 385			Utility filing fee	
1002 340	2002 170			Design filing fee	
1003 530	2003 265			Plant filing fee	
1004 770	2004 385			Reissue filing fee	
1005 160	2005 80			Provisional filing fee	
SUBTOTAL (1)		(\$) 0.00			

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

Total Claims	Independent Claims	Multiple Dependent	Extra Claims	Fee from below	Fee Paid
			-20** =	X	=
			- 3** =	X	=

Large Entity	Small Entity	Fee Description
1202 18	2202 9	Claims in excess of 20
1201 86	2201 43	Independent claims in excess of 3
1203 290	2203 145	Multiple dependent claim, if not paid
1204 86	2204 43	** Reissue independent claims over original patent
1205 18	2205 9	** Reissue claims in excess of 20 and over original patent
SUBTOTAL (2)		(\$) 0.00

*or number previously paid, if greater; For Reissues, see above

3. ADDITIONAL FEES

Large Entity	Small Entity	Fee Code (\$)	Fee Code (\$)	Fee Description	Fee Paid
1051 130	2051 65			Surcharge - late filing fee or oath	
1052 50	2052 25			Surcharge - late provisional filing fee or cover sheet	
1053 130	1053 130			Non-English specification	
1812 2,520	1812 2,520			For filing a request for ex parte reexamination	
1804 920*	1804 920*			Requesting publication of SIR prior to Examiner action	
1805 1,840*	1805 1,840*			Requesting publication of SIR after Examiner action	
1251 110	2251 55			Extension for reply within first month	
1252 420	2252 210			Extension for reply within second month	
1253 950	2253 475			Extension for reply within third month	
1254 1,480	2254 740			Extension for reply within fourth month	
1255 2,010	2255 1,005			Extension for reply within fifth month	
1401 330	2401 165			Notice of Appeal	
1402 330	2402 165			Filing a brief in support of an appeal	
1403 290	2403 145			Request for oral hearing	
1451 1,510	1451 1,510			Petition to institute a public use proceeding	
1452 110	2452 55			Petition to revive - unavoidable	
1453 1,330	2453 665			Petition to revive - unintentional	
1501 1,330	2501 665			Utility issue fee (or reissue)	
1502 480	2502 240			Design issue fee	
1503 640	2503 320			Plant issue fee	
1460 130	1460 130			Petitions to the Commissioner	
1807 50	1807 50			Processing fee under 37 CFR 1.17(q)	
1806 180	1806 180			Submission of Information Disclosure Stmt	
8021 40	8021 40			Recording each patent assignment per property (times number of properties)	
1809 770	2809 385			Filing a submission after final rejection (37 CFR 1.129(a))	
1810 770	2810 385			For each additional invention to be examined (37 CFR 1.129(b))	
1801 770	2801 385			Request for Continued Examination (RCE)	
1802 900	1802 900			Request for expedited examination of a design application	
Other fee (specify)					

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) **(\$)** 0.00

SUBMITTED BY

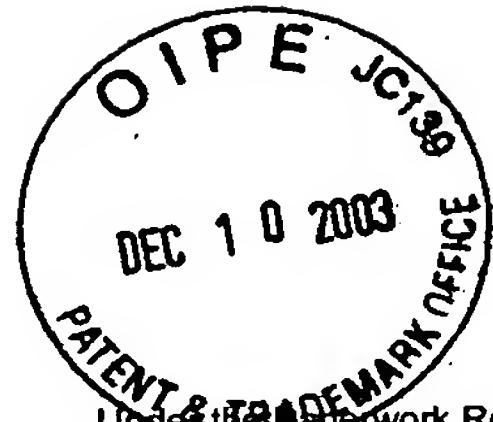
(Complete if applicable)

Name (Print/Type)	Winston Hsu	Registration No. (Attorney/Agent)	41,526	Telephone	886289237350
Signature				Date	12/18/2003

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PTO/SB/02B (11-00)

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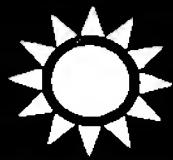
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DECLARATION — Supplemental Priority Data Sheet

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中華民國經濟部智慧財產局

INTELLECTUAL PROPERTY OFFICE
MINISTRY OF ECONOMIC AFFAIRS
REPUBLIC OF CHINA

茲證明所附文件，係本局存檔中原申請案的副本，正確無訛，
其申請資料如下：

This is to certify that annexed is a true copy from the records of this office of the application as originally filed which is identified hereunder:

申請日期：西元 2003 年 06 月 11 日
Application Date

申請案號：092115913
Application No.

申請人：威盛電子股份有限公司
Applicant(s)

局長
Director General

蔡練生

發文日期：西元 2003 年 8 月 15 日
Issue Date

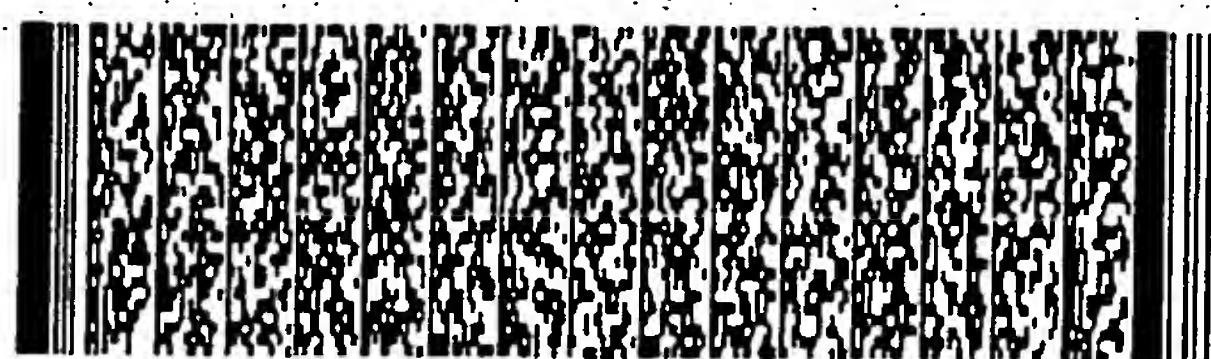
發文字號：09220825700
Serial No.

申請日期：	IPC分類
申請案號：	

(以上各欄由本局填註)

發明專利說明書

一、 發明名稱	中文	形成於二佈線層間之電感
	英文	INDUCTOR FORMED BETWEEN TWO LAYOUT LAYERS
二、 發明人 (共3人)	姓名 (中文)	1. 游永傑
	姓名 (英文)	1. Yu, Jay
	國籍 (中英文)	1. 中華民國 TW
	住居所 (中 文)	1. 台北縣新店市中正路五三三號八樓
	住居所 (英 文)	1. 8F, No. 533, Chung-Cheng Rd, Hsin-Tien City, Taipei Hsien, Taiwan, R. O. C.
	名稱或 姓名 (中文)	1. 威盛電子股份有限公司
三、 申請人 (共1人)	名稱或 姓名 (英文)	1. VIA TECHNOLOGIES, INC.
	國籍 (中英文)	1. 中華民國 TW
	住居所 (營業所) (中 文)	1. 台北縣新店市中正路五三三號八樓 (本地址與前向貴局申請者相同)
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	代表人 (中文)	1. 王雪紅
	代表人 (英文)	1. Wang, Hsueh-Hung



申請日期：	IPC分類
申請案號：	

(以上各欄由本局填註)

發明專利說明書

一、 發明名稱	中文	
	英文	
二、 發明人 (共3人)	姓名 (中文)	2. 徐鑫洲
	姓名 (英文)	2. Hsu, Jimmy
	國籍 (中英文)	2. 中華民國 TW
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	國籍 (中英文)	
	住居所 (營業所) (中文)	
	住居所 (營業所) (英文)	
	代表人 (中文)	
代表人 (英文)		



申請日期：	IPC分類
申請案號：	

(以上各欄由本局填註)

發明專利說明書

一、 發明名稱	中文	
	英文	
二、 發明人 (共3人)	姓名 (中文)	3. 李穎妮
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	國籍 (中英文)	3. 中華民國 TW
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三、 申請人 (共1人)	名稱或 姓名 (中文)	
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	住居所 (營業所) (中文)	
	住居所 (營業所) (英文)	
代表人 (中文)		
代表人 (英文)		



四、中文發明摘要 (發明名稱：形成於二佈線層間之電感)

五、(一)、本案代表圖為：第三圖
(二)、本案代表圖之元件代表符號簡單說明

六、英文發明摘要 (發明名稱: INDUCTOR FORMED BETWEEN TWO LAYOUT LAYERS)

An inductor includes a first layout layer, a second layout layer, a first conductive section, a second conductive section, a third conductive section, and a fourth conductive section. The first conductive section is on the first layout layer and the second conductive section is on the second layout layer. The third conductive section is parallel to the first conductive section and

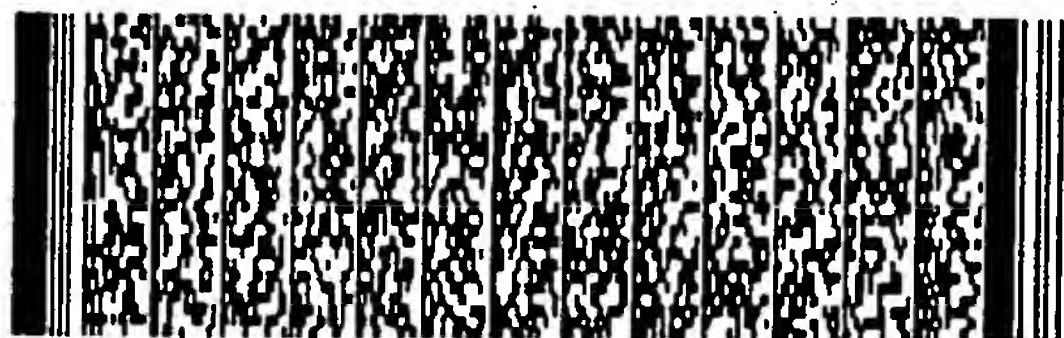


四、中文發明摘要 (發明名稱：形成於二佈線層間之電感)

14	雙佈線層電感	16	第一佈線層
18	第二佈線層	20	第一導線段
22	第二導線段	24	第三導線段
26	第四導線段	28	第一介層插塞
30	第二介層插塞	32	第三介層插塞

六、英文發明摘要 (發明名稱：INDUCTOR FORMED BETWEEN TWO LAYOUT LAYERS)

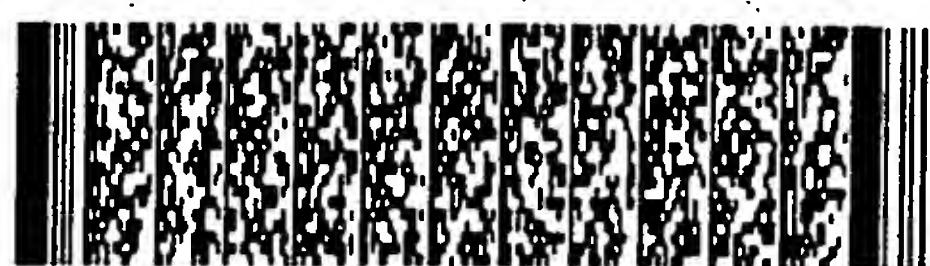
is on the first layout layer. The fourth conductive section is parallel to the second conductive section and is on the second layout layer. The first end of the first conductive section is connected to the first end of the second conductive section through a first via plug. The second end of the second conductive section is connected to the first end of the



四、中文發明摘要 (發明名稱：形成於二佈線層間之電感)

六、英文發明摘要 (發明名稱：INDUCTOR FORMED BETWEEN TWO LAYOUT LAYERS)

third conductive section through a second via plug. The second end of the third conductive section is connected to the first end of the fourth conductive section through a third via plug.



一、本案已向

國家(地區)申請專利

申請日期

案號

主張專利法第二十四條第一項優先權

無

二、主張專利法第二十五條之一第一項優先權：

申請案號：

無

日期：

三、主張本案係符合專利法第二十條第一項第一款但書或第二款但書規定之期間

日期：

四、有關微生物已寄存於國外：

寄存國家：

無

寄存機構：

寄存日期：

寄存號碼：

有關微生物已寄存於國內(本局所指定之寄存機構)：

寄存機構：

無

寄存日期：

寄存號碼：

熟習該項技術者易於獲得，不須寄存。



五、發明說明 (1)

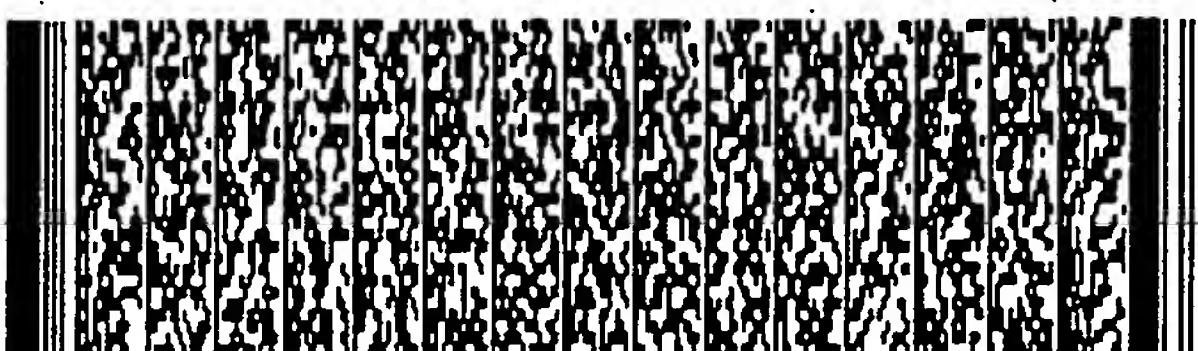
發明所屬之技術領域

本發明係提供一種電感，尤指一種形成於二佈線層間之電感。

先前技術

隨著半導體技術的進步，在低成本、小體積的要求下，無線通訊晶片必須將傳統的被動 (passive) 元件，如電感 (inductor)、變壓器 (transformer)、電容 (capacitor) 等儘可能整合到單一晶片上。晶片上的電感可被應用在無線積體電路設計上，如低雜訊放大器 (low noise amplifier, LNA)、混波器 (mixer)、壓控振盪器 (voltage controlled oscillator, VCO)、阻抗匹配網路及濾波器等。但由於晶片中電感的能量損耗過大，導致品質因數 (Quality factor) 過低，而增加電路設計的困難度，也不易設計出高感值的電感。

請參考圖一，圖體為一線圈在平面上形成感電，由端點 P1 開導體至另一端點 P2，以一點 0 為中心點，由數圈疊合而成。感電之示意图。



圈長度即可達到與習知平面式電感 10 相同的電感值，故效變圈可應化影響，而縮短可利用的頻率範圍。

發明內容

因此本發明之主要目的係提供一種印刷電路技術所製造的電感，以解決上述問題。

術，下導行四
路線層第二平第
電佈線一，
體二佈，段上
積第一上線層
用一第一層導線
使，該線三佈
種層於佈第一
一線成一
供佈形第一，該
提供一方式該上
圍第一方式於層
利含層形佈方式
專包線，二方式
申請，其佈段第一
之感第一導於線
該段之成導於線
本成行一，第一
製平，段該第一

五、發明說明 (4)

佈導插第第
二一層之之
第第介段段
該該二線線
於於第二導導
形成接一三三
該該二線線
導導一第連兩
之二連。

實施方式

圖 16 一段上形
如層層，線層式
佈佈 16 上導線方式
28，一二塞之導電逆
26層而以逆
意二一層第一22導線第
示第第線一第段
14之16及成一上成導塞
感18形二插第
電層式於層式第層及於
明線方式於介P1接P4
發佈之形佈之行一端連端
為第層20，二20平第一
三一線段於線成導26，一第30
圖含佈線成導26，一第30
該層第導介段
第二塞導段插第
導線段之塞一
該層第導介段
第一及第第導
該二三線層之
第一端該一四
導線層上，一一於及第
線塞端，端及該
一二端。

五、發明說明 (5)

時鐘方向螺旋狀流經各段導線，而最後由該電感 14 之端點 P8 流出，或可為由電感 14 之端點 P8 流入，在 -Y 方向以順時鐘方向螺旋狀流經各段導線，而最後由電感 14 之端點 P7 流出。

為配合不同佈線空間需求，本發明的電感另外四種不實的可進行不同變化，圖五A至圖五D為本發明圖五A至圖五D中，實形狀部份，虛線部份，導線段互導線段39亦平行之直導線段38係形成於第一佈線層16，導線段39亦平行之直導線段38係形成於第二佈線層18。如圖五A至圖五D所，電感50、52、54、56之位，於第一佈線層16的導線段39亦平行，且位於第二佈線層18的導線段39亦平行。圖五A與圖五B之介層插塞42係呈兩直線排列，但兩直線排列，圖五C之介層插塞42雖呈兩直線排列，但兩直線

排列互不平行，而圖五D之介層插塞42則不呈直線排列。由上述不同排列方式可知，電感14可於空間中做許多不同排列之變化，而達到空間設計變化之要求。

成，複來，介線組，包含層插數多，所感緣層複是，電述層個中，只層層複複而。故，線各，及，感，佈多，相，電段，為感，不感段線。可電互電線導線，構狀段狀導條範，感導線線述數之，導導所複明，電層各述的該發，之數且所層於本，明複，的同直屬，發含段層不垂皆，本包線同接可感，而是導不連塞電，就條離來插式，也數隔用層，冒。

五、發明說明 (7)

感電倍的，導有產作
積的數短電振效
單位面感需術減
高平面電習有率而
僅技術低增加而
提高為之較之諧
以值為明故亦可
提高因感發明諧
電本值發高諧振
感效應，以提高為
積功相因響，進而
電面積之同值，即
感可感品化影響，
增加感互的下，提
分布以於高即電烈
之值而體較生之寬
頻。

申明專利發明本發明之明確佳實施例，凡依本發明專利申請僅為本發明之明確佳實施例，皆屬本發明專利申請專利範圍所圍之做均等變化與修飾，請專利範圍涵蓋以上所屬。

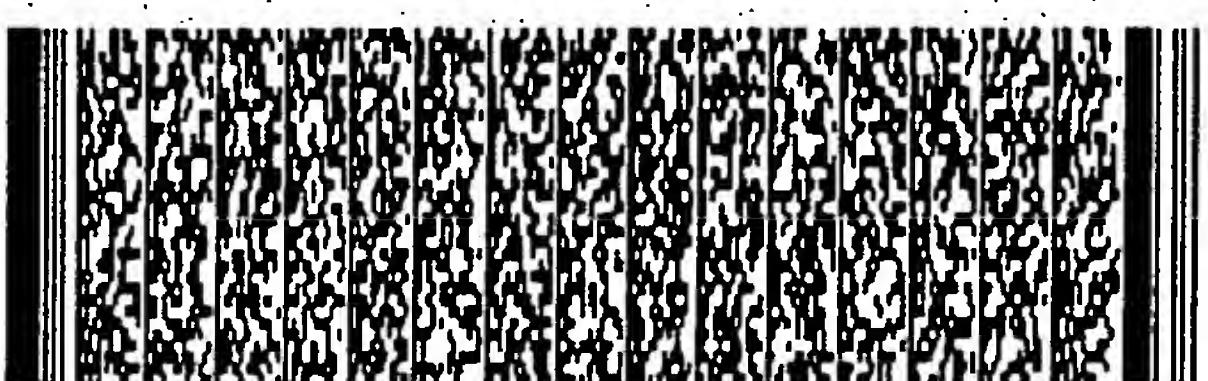


圖式簡單說明

圖式之符號說明

10	感	層	段	段	插	插	塞	塞
14	電	線	線	線	層	層	塞	
18	式	佈	導	導	介	介	插	
22	雙	第	第	第	第	第	介	
26	層	一	一	三	一	三	層	
30	感	電	層	段	插	板	方	方
34	電	層	線	線	線	層	路	列
50	感	電	層	段	插	板	方	方
52	電	層	線	線	線	層	路	列
54	式	線	佈	導	導	介	電	排
56	面	佈	二	二	四	二	刷	一
	平	雙	第	第	第	印	第	第



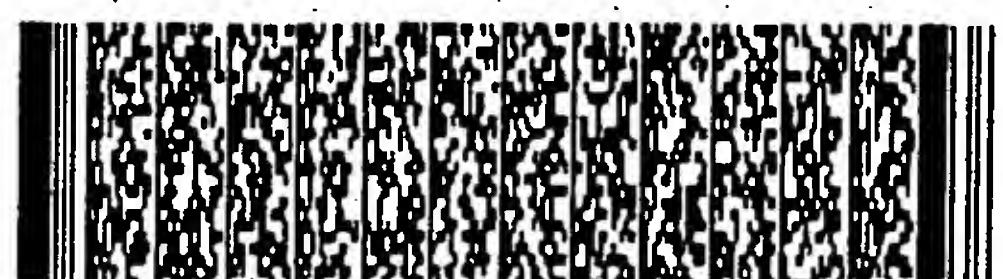


六、申請專利範圍

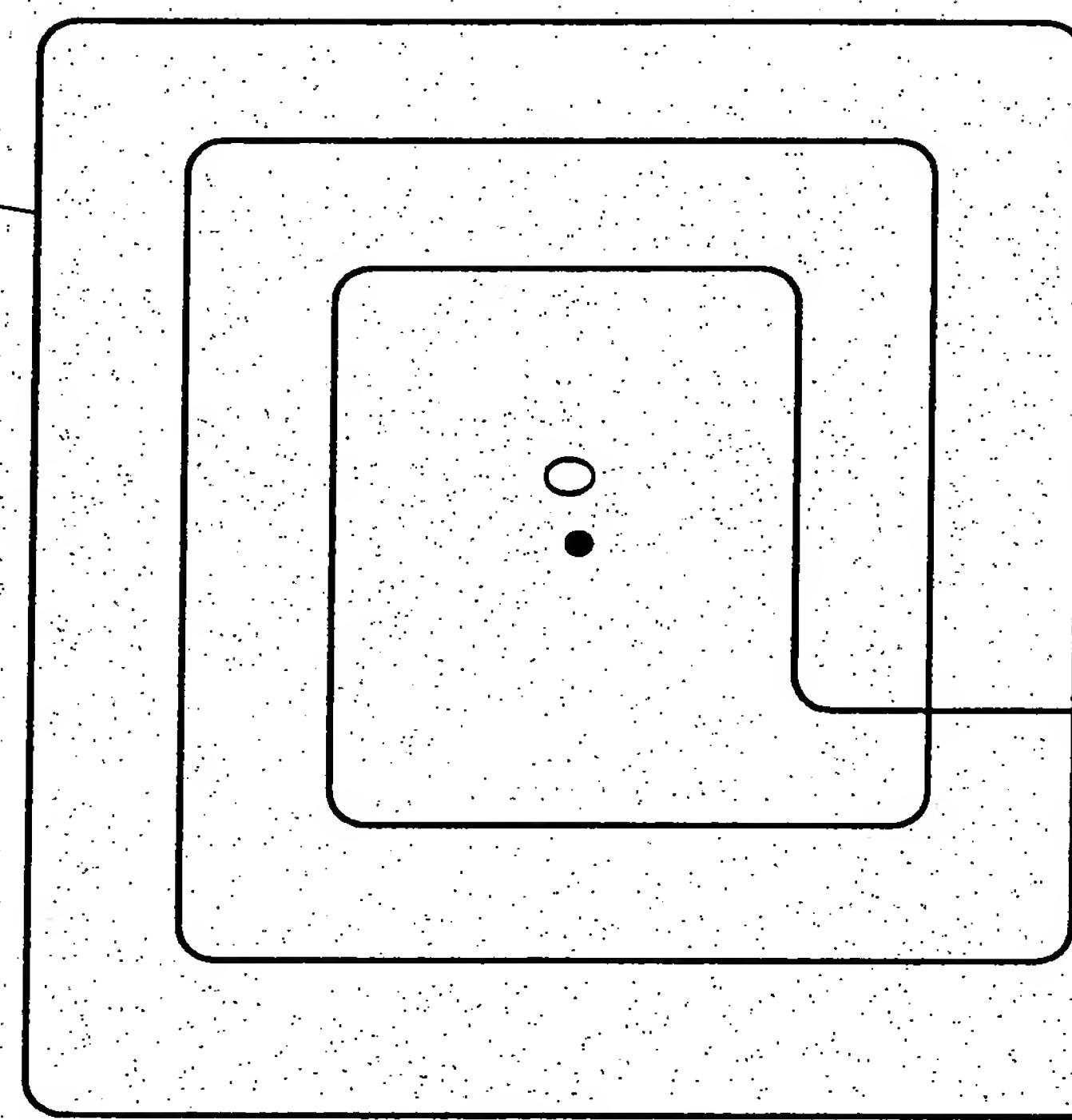
絕緣層，用來隔離不同層的所述導線狀電感；複數個介層插塞，用來連接不同層的所述導線段電感。

4. 如申請專利範圍第4項所述之電感，其中所述複數層導線狀電感為兩層。

5. 如申請專利範圍第5項所述之電感，其中所述該複數個介層插塞垂直於該複數條導線段電感。



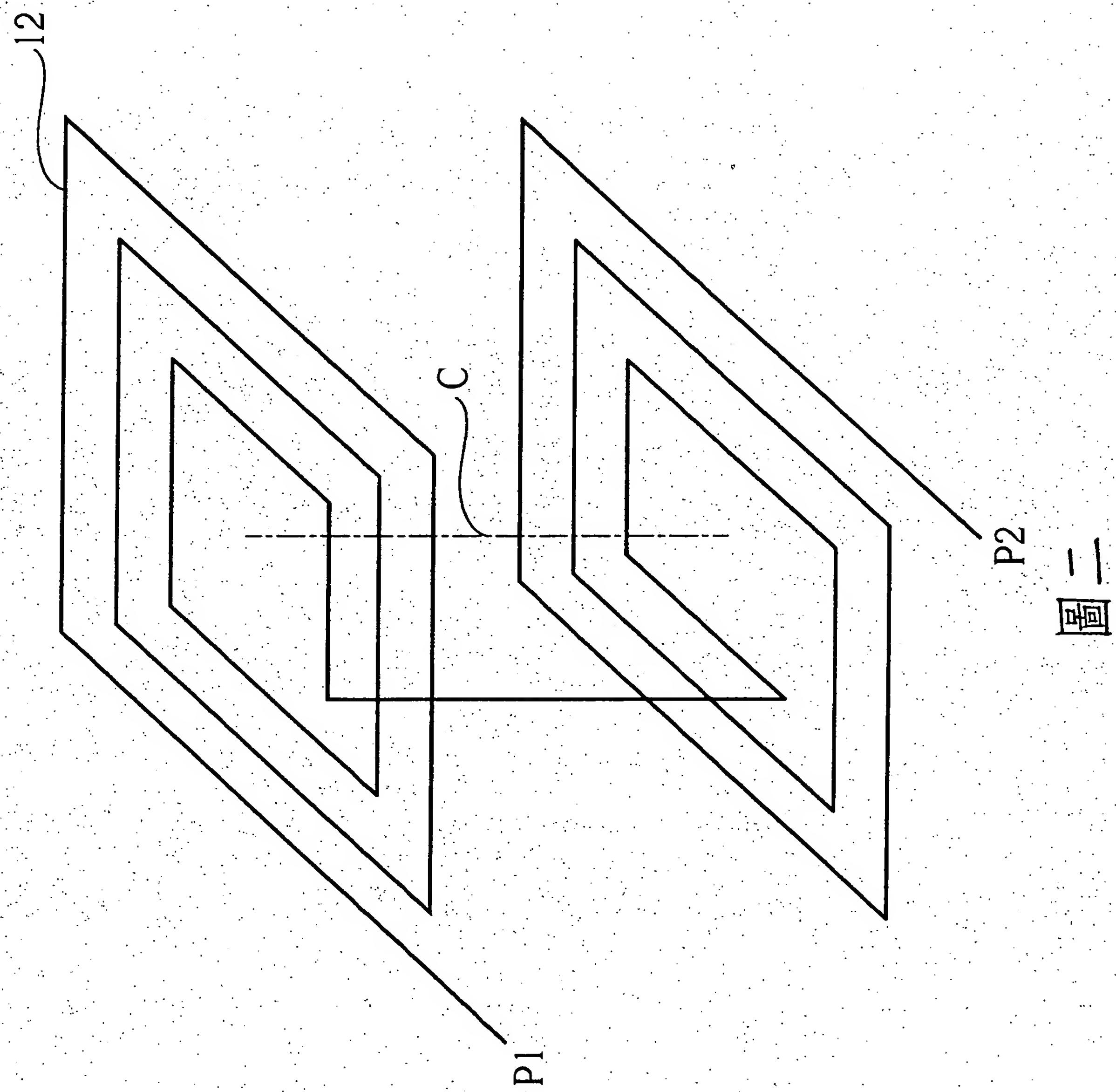
10

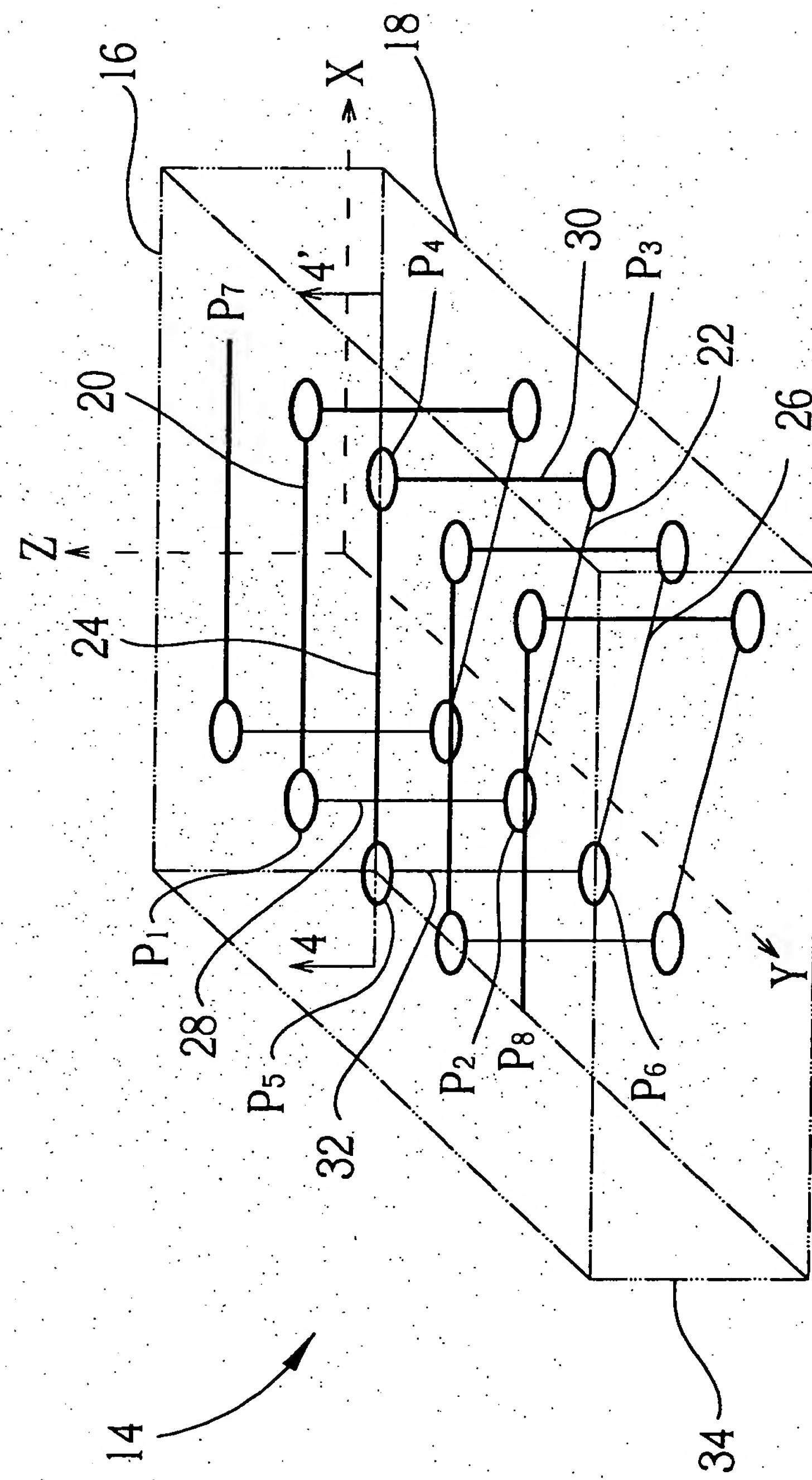


P₁

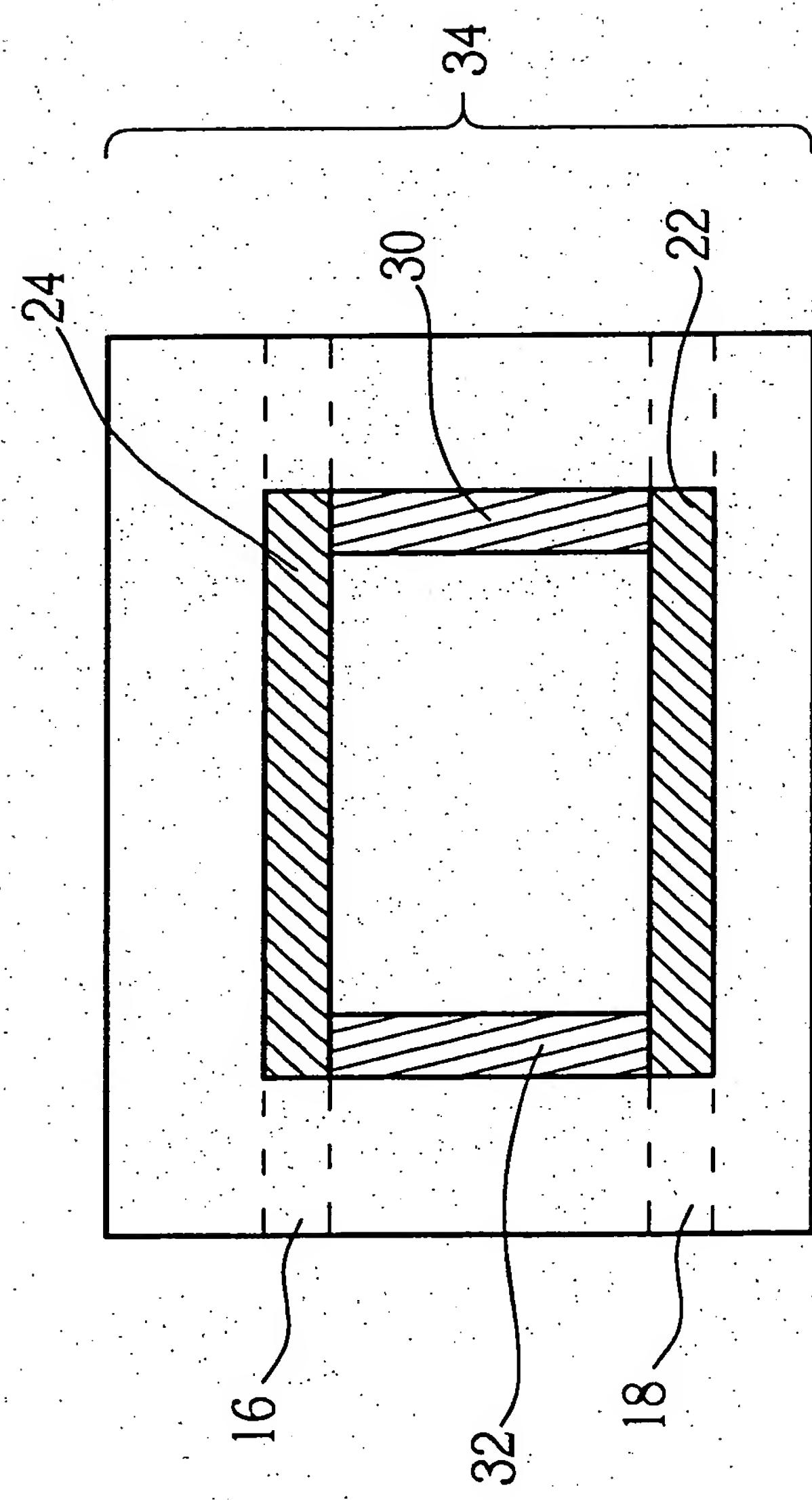
P₂





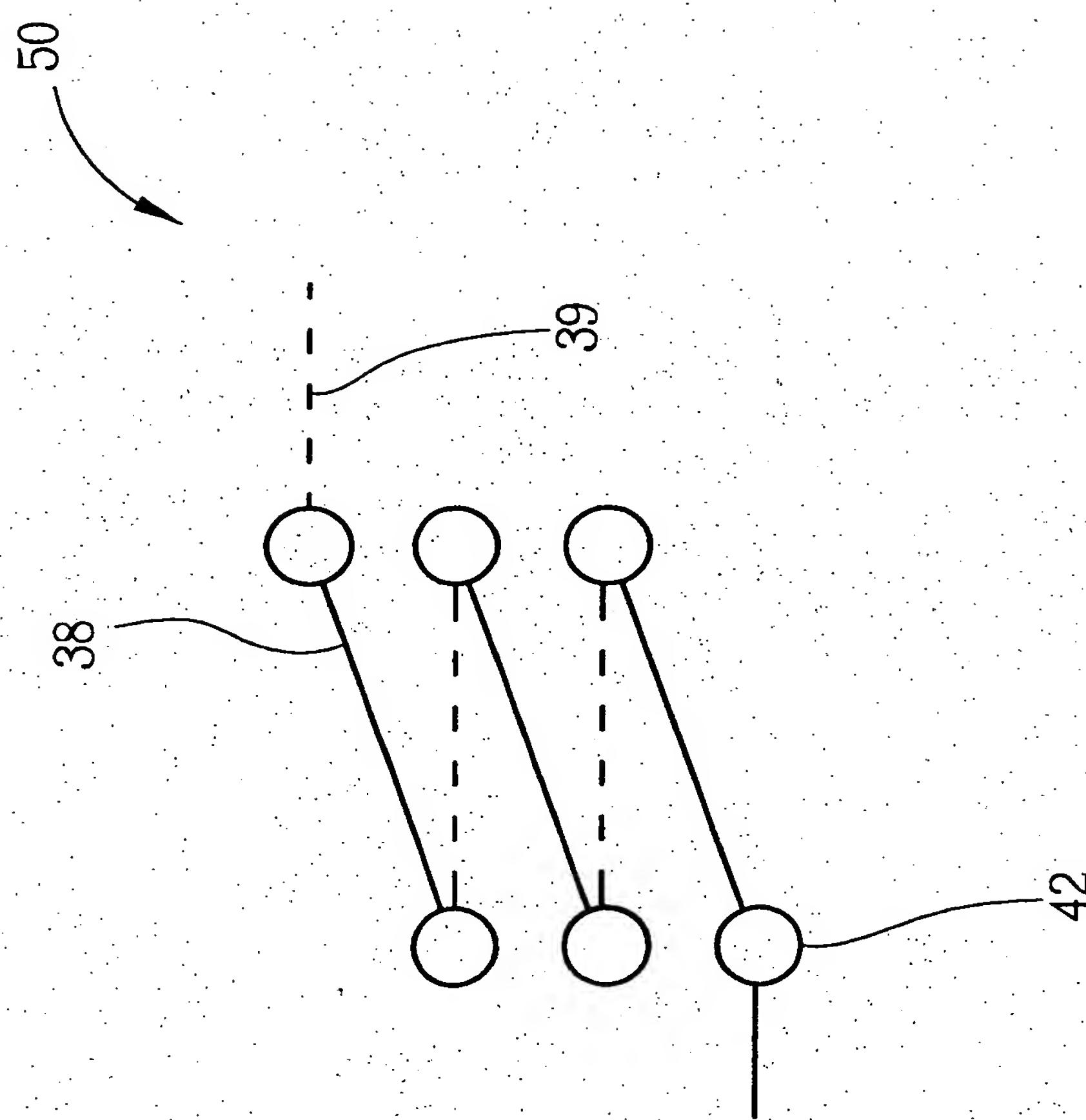


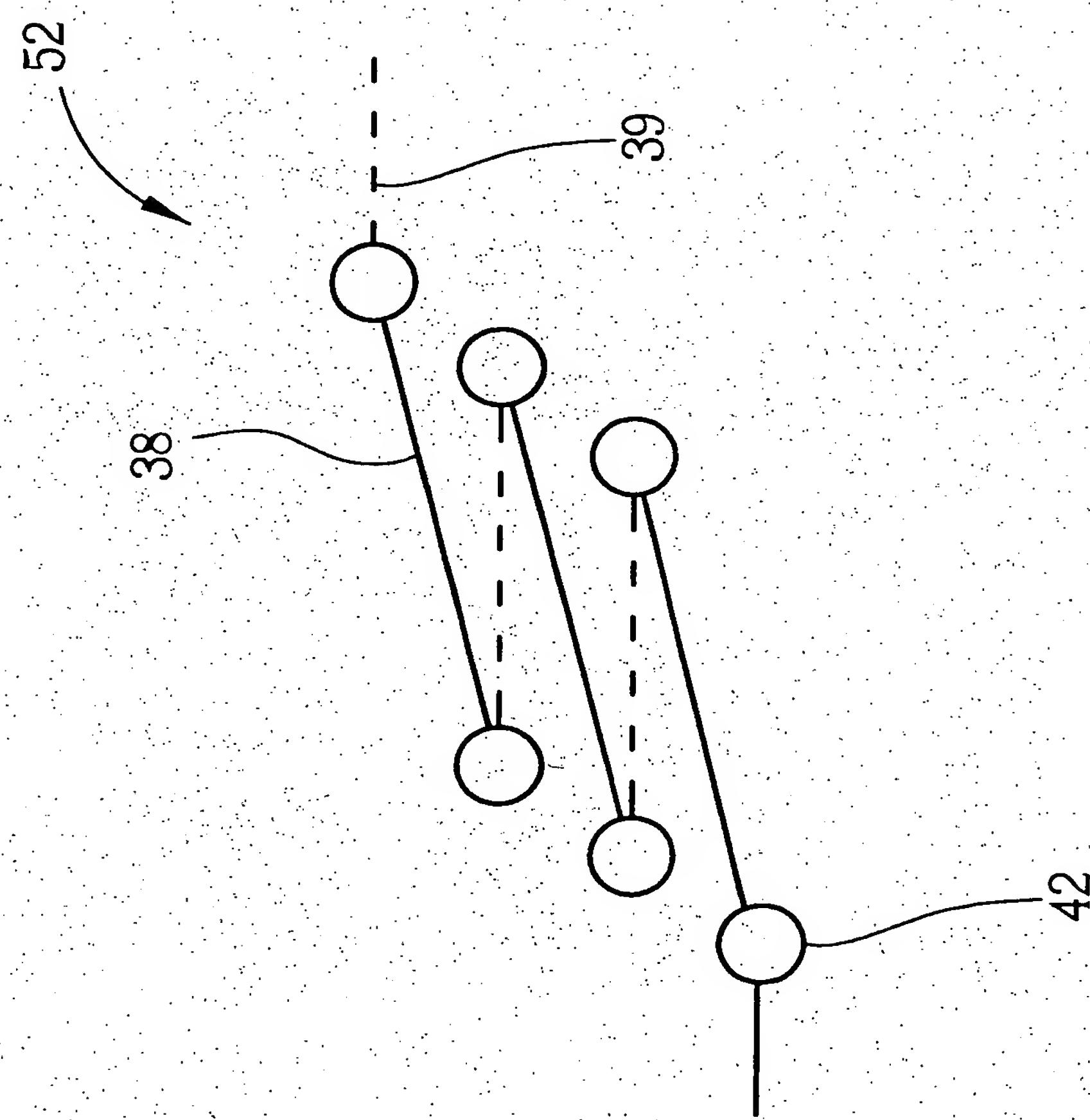
圖三



圖四

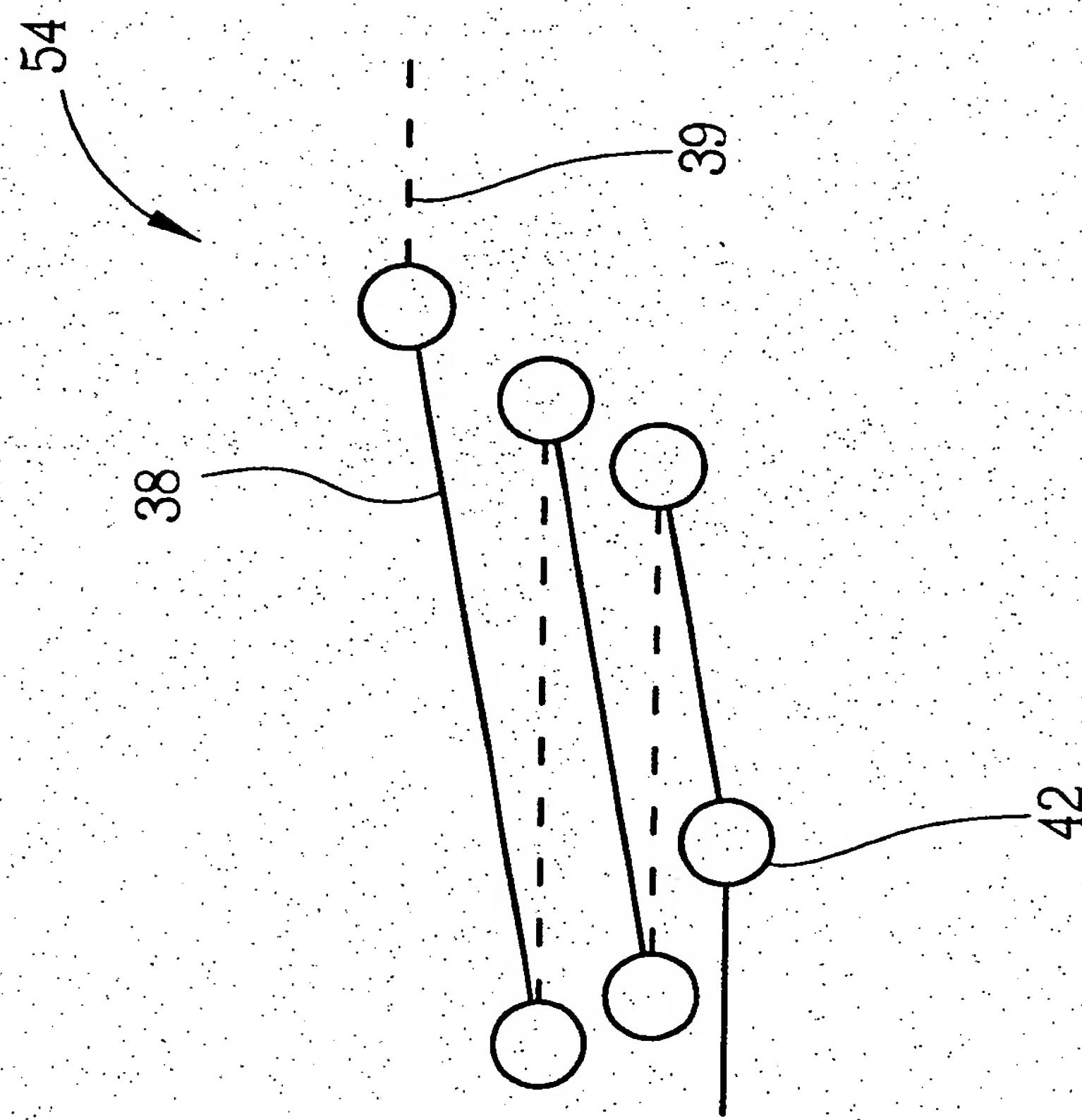
圖五A



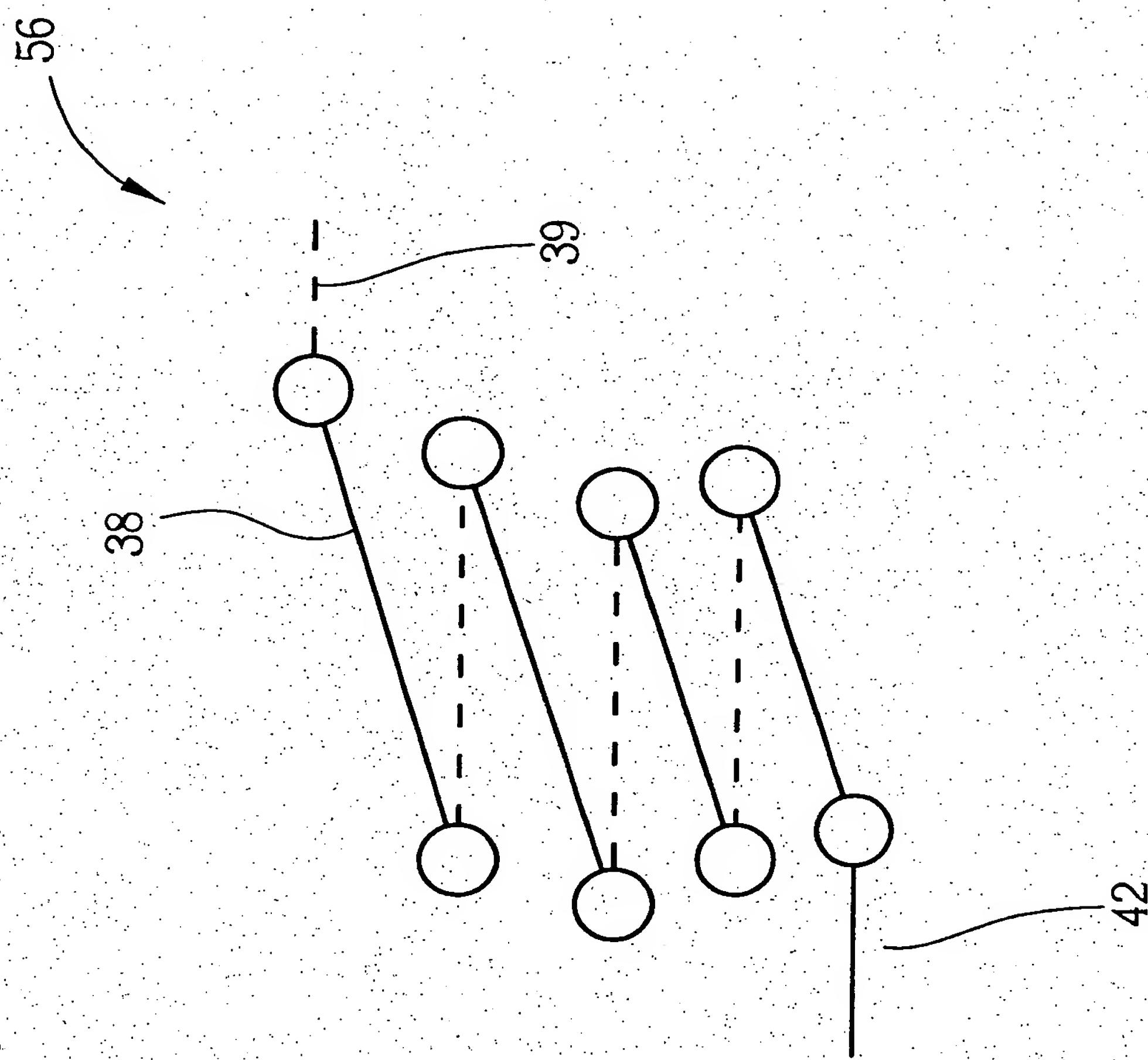


圖五B

圖五C



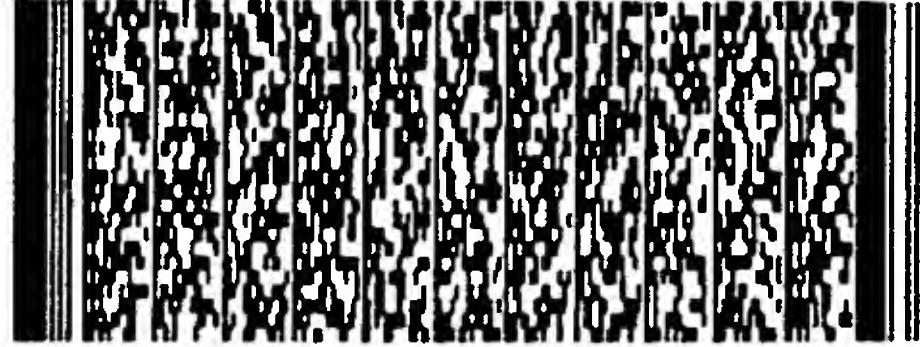
圖五D



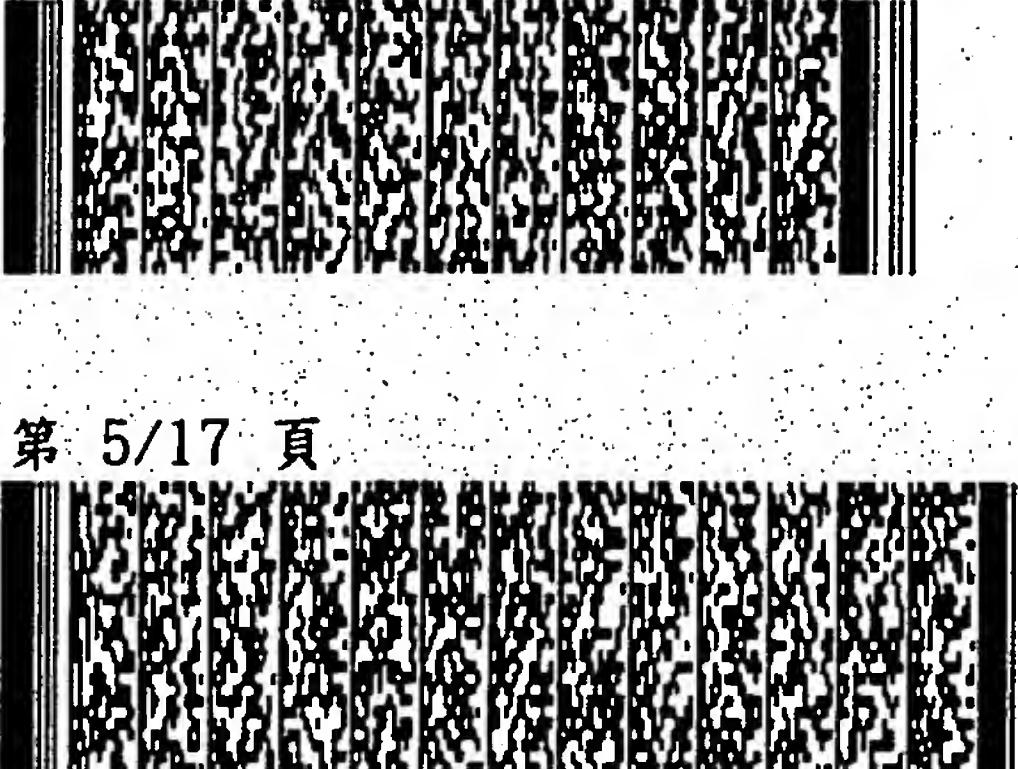
第 1/17 頁



第 2/17 頁



第 3/17 頁



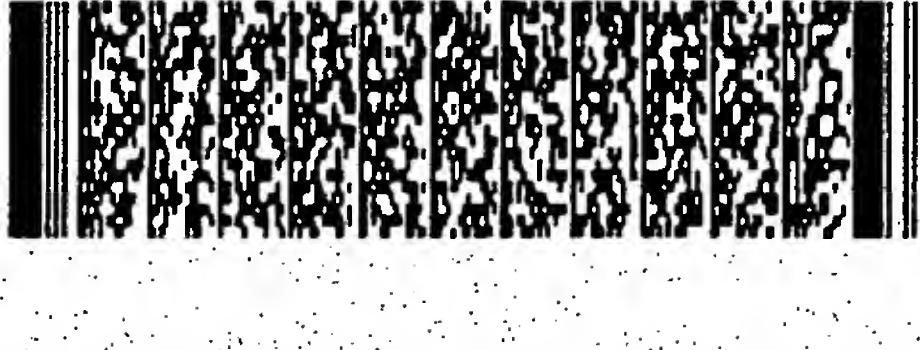
第 4/17 頁



第 5/17 頁



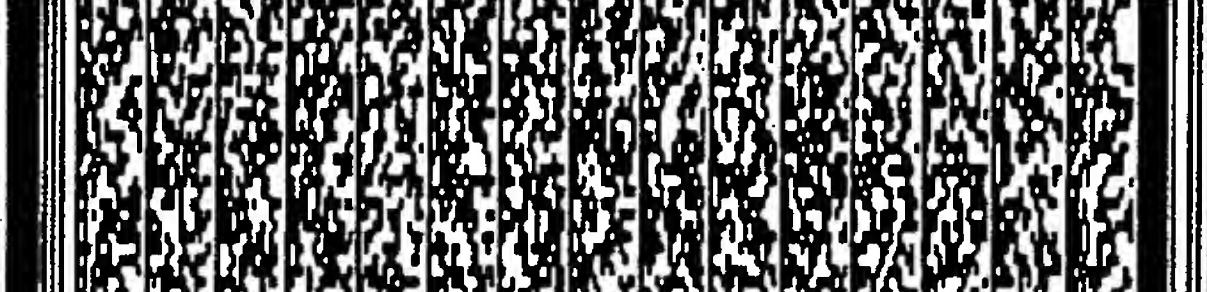
第 6/17 頁



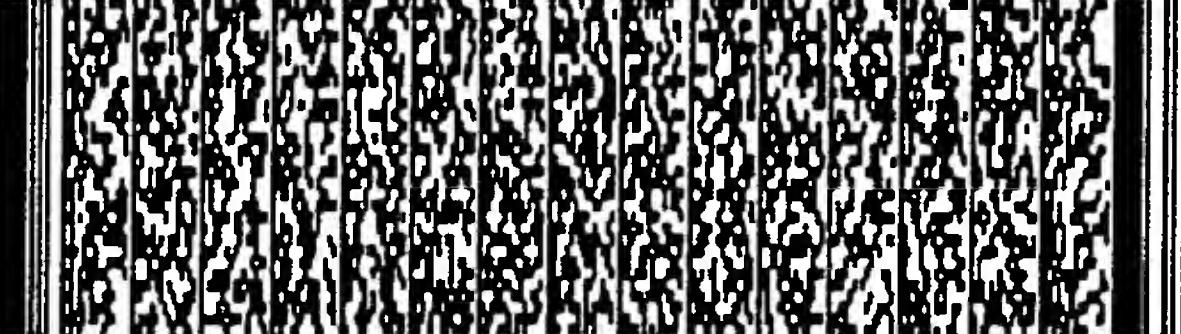
第 7/17 頁



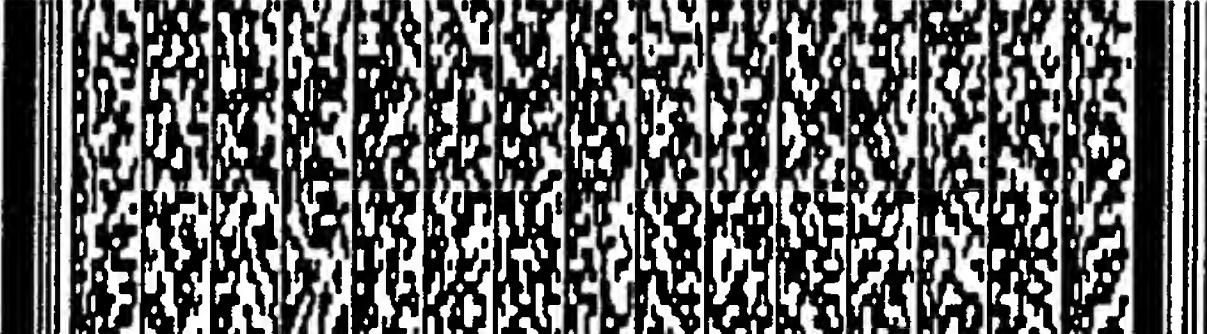
第 8/17 頁



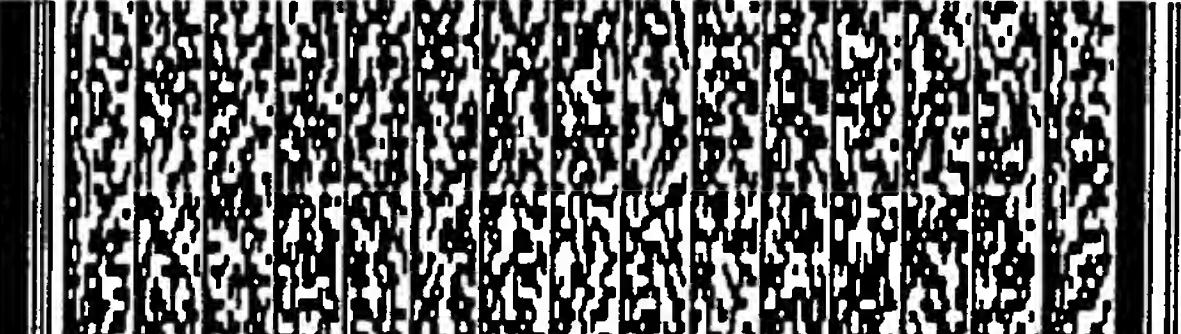
第 8/17 頁



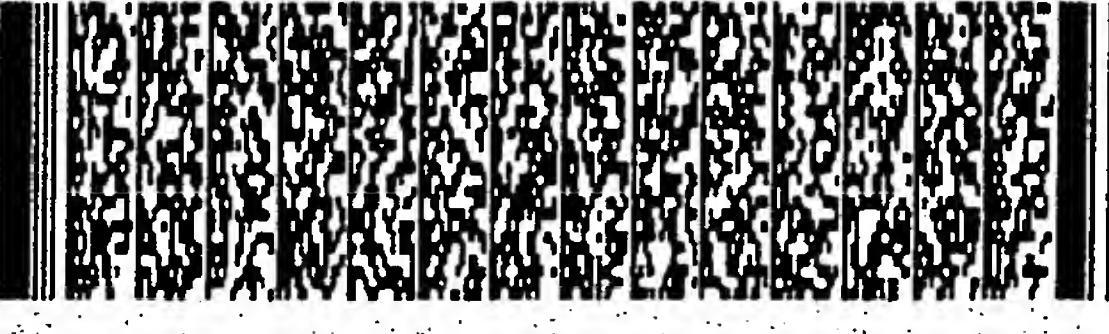
第 9/17 頁



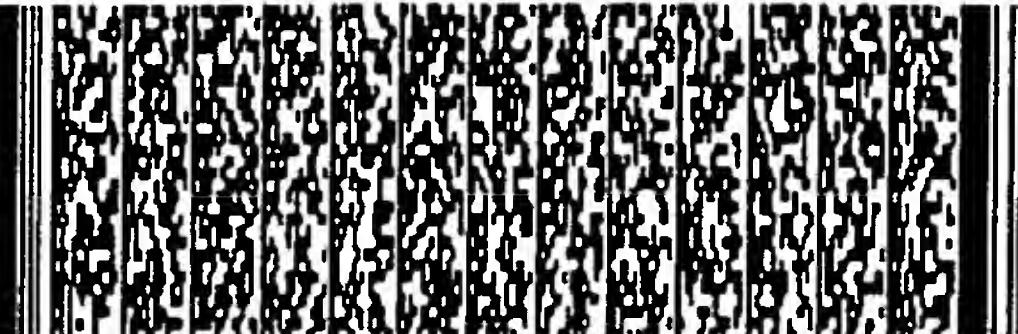
第 9/17 頁



第 10/17 頁



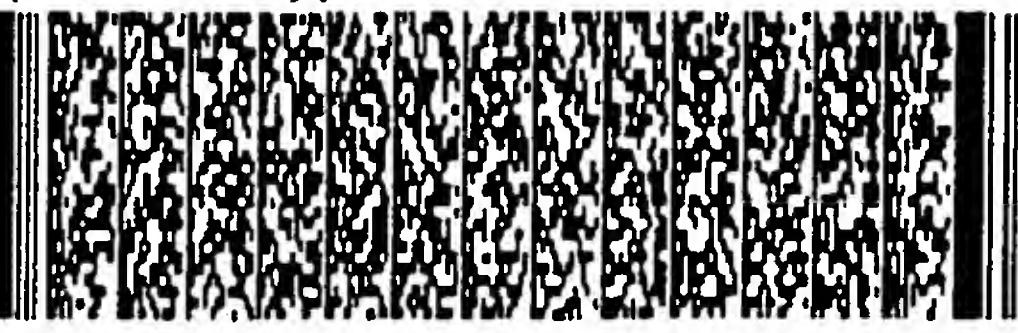
第 10/17 頁



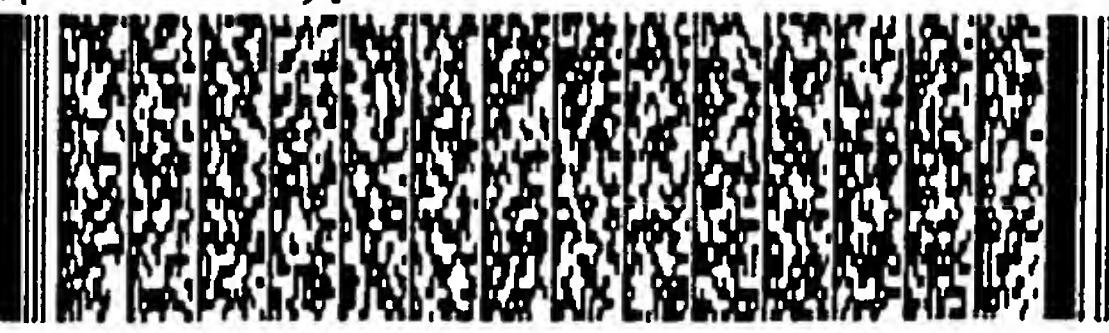
第 11/17 頁



第 11/17 頁

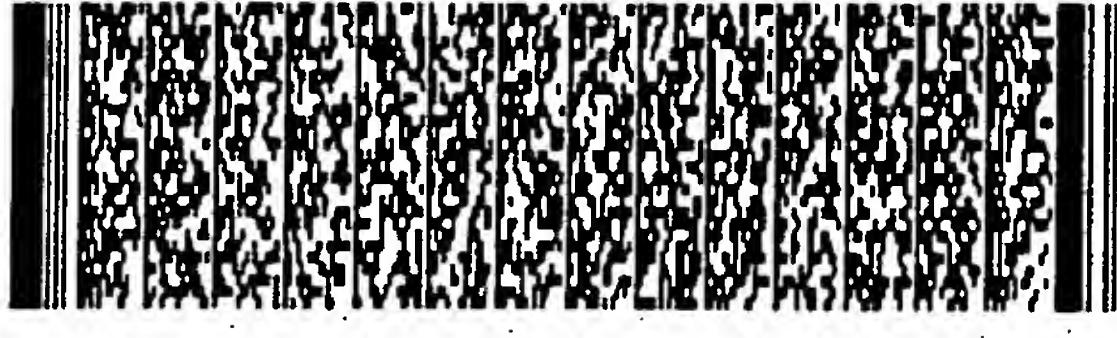


第 12/17 頁



(4.5版)申請案件名稱:形成於二佈線層間之電感

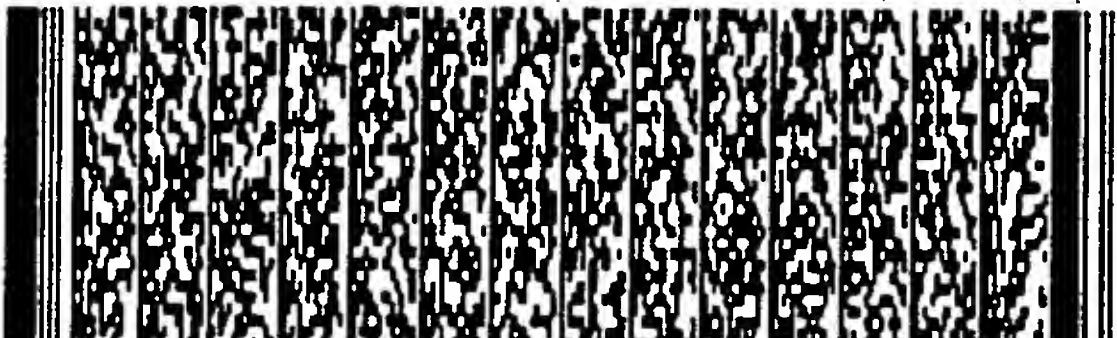
第 12/17 頁



第 13/17 頁



第 13/17 頁



第 14/17 頁



第 15/17 頁



第 16/17 頁



第 17/17 頁

